

# APS

## DISTRICT MIDDLE SCHOOL SCIENCE CURRICULUM FRAMEWORK

Course Title: Science 6 Course Number: SEE BELOW

Department: Science ADS Number: SEE BELOW

Prerequisites: None

Length of Course: One Year Credit/PRI Area: .50 per Semester Grade Level(s): 6

### COURSE AND ADS NUMBERS:

|                                  |   |          |                         |   |          |
|----------------------------------|---|----------|-------------------------|---|----------|
| 40600 SCIENCE 6                  | } | 17054143 | 07056 SCIENCE 6 D LEVEL | } | 17052143 |
| 40601 SCIENCE 6                  |   |          | 07156 SCIENCE 6 C LEVEL |   |          |
| 40602 SCIENCE 6                  |   |          | 07256 SCIENCE 6 B LEVEL |   |          |
| 40603 SCIENCE 6                  |   |          | 07456 SCIENCE 6 BIP     |   |          |
| 4060B SCIENCE 6 BILINGUAL        |   | 17058143 |                         |   |          |
| 4060D SCIENCE 6 DUAL<br>LANGUAGE |   | 17058143 | 07556 SCIENCE 6 GIFTED  |   | 17056143 |

### *Important Notes:*

### COURSE DESCRIPTION:

Science 6 is an inquiry, laboratory-based course that focuses on the use of science process skills to facilitate the mastery of the state science standards. Areas of study include, but are not limited to, scientific thinking and practice; physical, life, and earth science content, and science and society, with the focus for sixth grade being earth and space science. Reading, writing, speaking, and research strategies are integrated throughout the course.

References in parentheses following each performance standard refer to and are aligned with the New Mexico Science Standards (NM), Albuquerque Public Schools Mathematics Standards (APS-MA), and the APS Language Arts standards (APS-LA).

**STRATEGIES:**

The “Illustrations” column provides exemplars of the performance standards, strategies, and the best practices suggested by middle school science teachers in the Albuquerque Public Schools.

**ASSESSMENTS:**

The “Illustrations” column incorporates a variety of assessments and “check for” items suggested by middle school science teachers in APS. Assessments include authentic and performance-based assessment, cooperative learning, teacher observation, role playing, checklists, rubrics, tests and exams, formal and informal writing, small group and full class discussion, oral and multimedia presentations, projects, demonstrations, and portfolios.

**SUGGESTED TEXTBOOKS AND INSTRUCTIONAL MATERIALS:**

- Current state adopted science textbooks
- Lawrence Hall of Science: GEMS “Invisible Universe”; “Life Through Time”; “The Real Reason for Seasons”
- New Mexico Museum of Natural History: *Proyecto Futuro* – science curricula for Earth, life, and physical in English and Spanish
- Rio Grande Bosque Education Guide
- *Roadside Geology of New Mexico*
- *Science Experiments Book 2, Earth Science*, Williams, Tammy, Mark Twain Media/Carson-Dellosa Publishing
- *Big Book of Science for Middle School and High School*, Zike, Dinah

**SUGGESTED TITLES/AUTHORS WEB SITES:**

- <http://www.iris.edu> world-wide earthquake web quest
- <http://www.tremor.nmt.edu> New Mexico earthquakes

Approved by MSCB: October 2004

**STRAND I: SCIENTIFIC THINKING AND PRACTICE**

**CONTENT STANDARD:** The student understands the processes of scientific investigations and uses inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

**BENCHMARKS:** A. The student uses scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.  
B. The student understands the processes of scientific investigation and how scientific inquiry results in scientific knowledge.  
C. The student uses mathematical ideas, tools, and techniques to understand scientific knowledge.

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS   |
|------------|---|---|
|            | <ol style="list-style-type: none"><li>1. Constructs appropriate graphs from data and develops qualitative and quantitative statements about the relationships between variables being investigated (NM-IA.1; APS-MA-IV.2, IV.6).</li><li>2. Examines the reasonableness of data supporting a proposed scientific explanation (NM-IA.2; APS-MA-IV.6).</li><li>3. Justifies predictions and conclusions based on data (NM-IA.3; APS-MA-I.9, I.10, IV.6).</li><li>4. Understands that scientific knowledge is continually reviewed, critiqued, and revised as new data become available (NM-IB.1).</li><li>5. Understands that scientific investigations use common processes that include the collection of relevant data and observations, accurate measurements, the identification and control of variables, and logical reasoning to formulate hypotheses and explanations (NM-IB.2; APS-MA-IV.3).</li><li>6. Understands that not all investigations result in defensible scientific explanations (NM-IB.3).</li><li>7. Evaluates the usefulness and relevance of data to an investigation (NM-IC.1; APS-MA-IV.6).</li></ol> | <p><b>NOTE: Illustrations include suggested activities for attaining each performance standard. A check for (✓) refers to a key feature to look for while assessing student performance.</b></p> <p>1 – 8. The student chooses either an experiment or survey to apply all the science process skills he/she has learned. He/She completes the following steps:</p> <ul style="list-style-type: none"><li>• Asks a question about a physical or biological event or relationship that offers the potential for experimentation.</li><li>• Meets with the teacher to get final approval on the experiment or survey plan.</li><li>• Chooses a manipulated variable and a responding variable and defines the variables so they can be measured.</li><li>• Writes a specific research question.</li><li>• Writes hypotheses that provide an exact focus for the experiment.</li><li>• Conducts a library search about topic and writes a review of the literature (i.e., summary of the information). Looks for up-to-date resources and compares differing points of view.</li><li>• Designs an experiment to collect data that answers the research question and hypotheses, remembering to control all variables except the manipulated and responding variables.</li><li>• Writes a procedure for experiment.</li><li>• Gathers materials.</li><li>• Conducts the experiment, remembering more data is better than less data.</li><li>• Compiles the results. Records quantitative data in data tables and includes graphs to help with interpretation. Qualitative data also recorded.</li></ul> |

| GRADE<br>6 | PERFORMANCE STANDARDS  | ILLUSTRATIONS   |
|------------|--|---|
|            | <p>8. Uses probabilities, patterns, and relationships to explain data and observations (NM-IC.2; APS-MA-IV.6).</p> | <ul style="list-style-type: none"> <li>• Interprets the data. Uses patterns and relationships to explain data, make inferences, and justify predictions and conclusions. Evaluates usefulness of data and makes recommendations.</li> <li>• Prepares a final report of the experiment results/survey findings.</li> <li>• Acknowledges that the experiment is valid even if the hypothesis is not supported by the investigation.</li> <li>• Types or clearly writes final product.</li> </ul> <p>The project is assessed by a student-teacher generated rubric.</p> <ul style="list-style-type: none"> <li>✓ completion of all required components</li> <li>✓ variety of sources</li> <li>✓ analysis</li> <li>✓ communication skills</li> <li>✓ adherence to rubric</li> </ul> |

**STRAND II: CONTENT OF SCIENCE**

**CONTENT STANDARD I (PHYSICAL SCIENCE):** The student understands the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

- BENCHMARKS:**
- A. The student knows the forms and properties of matter and how matter interacts.
  - B. The student explains the physical processes involved in the transfer, change, and conservation of energy.
  - C. The student describes and explains forces that produce motion in objects.

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS  |
|------------|---|--|
|            | <ol style="list-style-type: none"><li>1. Understands that substances have characteristic properties and identifies the properties (e.g., density, boiling point, solubility, chemical reactivity) of various substances (NM-II-IA.1).</li><li>2. Uses properties (e.g., for minerals: hardness, streak, color, reactivity to acid, cleavage, fracture) to identify substances (NM-II-IA.2).</li><li>3. Knows that there are about 100 known elements that combine to produce compounds in living organisms and nonliving substances (NM-II-IA.3).</li><li>4. Knows the differences between chemical and physical properties and how these properties can influence the interactions of matter (NM-II-IA.4).</li></ol> | <ol style="list-style-type: none"><li>1. The student creates a chart or a table that describes the characteristic properties of matter (e.g., solid, liquid, gas). Using a foldable found in Zike's <i>Big Book of Science</i> helps in the organization of this information.<ul style="list-style-type: none"><li>✓ thoroughness</li><li>✓ accuracy</li></ul></li><li>2 – 4. The student tests mineral specimens for physical properties (e.g., luster, hardness) and completes a matrix to categorize his/her findings. Using this matrix, the student writes riddles based on his/her observations of chemical and physical properties of the specimens. He/She challenges classmates to answer the riddles.<ul style="list-style-type: none"><li>✓ correct identification of unknown mineral</li><li>✓ comprehension of the differences between chemical and physical properties</li><li>✓ use of appropriate vocabulary</li></ul></li></ol> <p style="text-align: center;">OR</p> <p>The student conducts a heating/cooling and crystallization experiment to determine what causes the size of crystals. He/She records observations in table form, writing how the crystal size varies, how the crystal size relates to how fast the drop evaporates, which drops are most like intrusive rocks, which drops are most like extrusive rocks, relating all of the data to the Earth and rock formation.</p> <ul style="list-style-type: none"><li>✓ accurate observations</li><li>✓ explanation of relationship between heating/cooling and crystal formation</li><li>✓ completion of task</li><li>✓ logical interpretation of data</li></ul> |

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS  |
|------------|---|--|
|            | <p>5. Identifies the various types of energy (e.g., heat, light, mechanical, electrical, chemical, nuclear) (NM-II-IB.1).</p> <p>6. Understands that heat energy can be transferred through conduction, radiation, and convection (NM-II-IB.2).</p> <p>7. Knows that there are many forms of energy transfer but that the total amount of energy is conserved (i.e., that energy is neither created nor destroyed) (NM-II-IB.3).</p> <p>8. Understands that some energy travels as waves (e.g., seismic, light, sound), including:</p> <ul style="list-style-type: none"> <li>• the sun as source of energy for many processes on Earth</li> <li>• different wavelengths (e.g., visible, ultraviolet, infrared) of sunlight</li> <li>• vibrations of matter (e.g., sound earthquakes)</li> <li>• different speeds through different material (NM-II-IB.4).</li> </ul> <p>9. Knows that every object exerts gravitational force on every other object (e.g., motions of celestial objects, tides) dependent on the masses and distance of separation (NM-II-IC.1).</p> <p>10. Knows that gravitational force is hard to detect unless one of the objects (e.g., Earth) has a lot of mass (NM-II-IC.2).</p> | <p>5. See Strand II (Content of Science), Content Standard III (Earth and Space Science), Illustration #3.</p> <p>6. The student models convection currents using different temperatures of water and an indicator (e.g., rice, food color) to show the circular motion of current. He/She illustrates and describes observations for each trial in a science log.</p> <ul style="list-style-type: none"> <li>✓ variety of water temperatures</li> <li>✓ accurate observations and descriptions</li> <li>✓ placement in science log</li> </ul> <p>7, 8. (last 2 bullets) Using a Slinky or a piece of rope, the student models the transfer of energy through waves and vibration. He/She analyzes how different forces impact the speed and frequency of waves, creating a table that describes the maximum number of waves, the length of the shortest wave, the height of the wave, and how hard it was to make the waves.</p> <ul style="list-style-type: none"> <li>✓ thoroughness</li> <li>✓ accurate analysis</li> <li>✓ generalization to earthquakes</li> </ul> <p>8. (first bullet) The student diagrams and labels the layers of the sun, describing the characteristics of each layer and how they impact the Earth.</p> <ul style="list-style-type: none"> <li>✓ accuracy</li> </ul> <p>(second bullet) The student uses a prism to separate light into its visible wavelengths, describing what he/she sees [i.e., <b>ROY G BIV</b> (Red, Orange, Yellow, Green, Blue, Indigo, Violet)].</p> <ul style="list-style-type: none"> <li>✓ clear communication</li> </ul> <p>9, 10. After a demonstration of gravity, the student creates a diagram depicting the forces holding planets, their moons, and the asteroids, using arrows to illustrate the direction of various gravitational and inertial forces. The student writes a description of how gravity holds objects in their orbits in the solar system.</p> <ul style="list-style-type: none"> <li>✓ direction of force labeled accurately</li> <li>✓ accurate, clear explanation of gravity</li> </ul> |

**STRAND III: CONTENT OF SCIENCE**

**CONTENT STANDARD (LIFE SCIENCE):** The student understands the properties, structures, and processes of living things and the interdependence of living things and their environments.

**BENCHMARKS:** A. The student explains the diverse structures and functions of living things and the complex relationships between living things and their environments.  
B. The student understands how traits are passed from one generation to the next and how species evolve.  
C. The student understands the structure of organisms and the function of cells in living systems.

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS  |
|------------|---|--|
|            | <ol style="list-style-type: none"><li>1. Understands how organisms interact with their physical environments to meet their needs (i.e., food, water, air) and how the water cycle is essential to most living systems (NM-II-IIA.1).</li><li>2. Describes how weather and geologic events (e.g., volcanoes, earthquakes) affect the function of living systems (NM-II-IIA.2).</li><li>3. Describes how organisms have adapted to various environmental conditions (NM-II-IIA.3).</li><li>4. Understands that the fossil record provides data for how living organisms have evolved (NM-II-IIB.1).</li><li>5. Describes how species have responded (e.g., extinction, adaptation) to changing environmental conditions over time (NM-II-IIB.2).</li><li>6. Explains how fossil fuels were formed from animal and plant cells (NM-II-IIC.1).</li><li>7. Describes the differences between substances (e.g., fossil fuels) that were produced by living organisms and substances (e.g., igneous rocks) that result from nonliving processes (NM-II-IIC.2).</li></ol> | <p>1 – 5. As part of a small group, the student researches a time period in geologic history. The research includes the physical environment (e.g., continental drift), organisms, environmental conditions (e.g., water, atmosphere, land), and a scale model time line (e.g., 1 cm = x years) of the time period. The group creates a diorama, aquarium/terrarium (See Zike's book.) to illustrate the period. The visual display is presented to the class. As other presentations are made, the student completes a table describing the time period, atmosphere/weather, animals, plants, and conditions of the land and water. Using the completed table, the student creates a time-travel journal describing the Earth through each time period (See geologic calendar in <i>Roadside of New Mexico</i> to connect with events occurring in New Mexico.).</p> <ul style="list-style-type: none"><li>✓ participation</li><li>✓ accurate diorama</li><li>✓ accurate time line</li><li>✓ presentation skills</li><li>✓ completion of table</li><li>✓ thoroughness of journal entry</li><li>✓ writing conventions</li></ul> <p>6. The student creates a graphic organizer (e.g., flow chart, concept map) showing the progression from animal/plant to fossil fuel.</p> <ul style="list-style-type: none"><li>✓ thoroughness</li><li>✓ accuracy</li></ul> <p>7. The student completes a graphic organizer (e.g., Venn diagram) comparing substances produced from living organisms and nonliving processes.</p> <ul style="list-style-type: none"><li>✓ visual clarity</li></ul> |

**STRAND IV: CONTENT OF SCIENCE**

**CONTENT STANDARD (EARTH AND SPACE SCIENCE):** The student understands the structure of the Earth, the solar system and the universe, the interconnections among them, and the processes and interactions of Earth's systems.

- BENCHMARKS:** A. The student describes how the concept of energy, matter, and force can be used to explain the observed behavior of the solar system, the universe, and their structures.
- B. The student describes the structure of Earth and its atmosphere and explains how energy, matter, and forces shape Earth's systems.

| GRADE<br>6 | PERFORMANCE STANDARDS  | ILLUSTRATIONS   |
|------------|--|---|
|            | <p><b>Universe</b></p> <p>1. Describes the objects in the universe including:</p> <ul style="list-style-type: none"><li>billions of galaxies, each containing billions of stars,</li><li>different sizes, temperatures, and colors of stars in the Milky Way galaxy (NM-II-III.A.1).</li></ul> <p><b>Solar System</b></p> <p>2. Locates the solar system in the Milky Way galaxy (NM-II-III.A.2).</p> <p>3. Identifies the components of the solar system and describes their defining characteristics and motions in space including:</p> <ul style="list-style-type: none"><li>sun as a medium star,</li><li>sun's composition (i.e., hydrogen, helium) and energy production,</li><li>nine planets, their moons, asteroids (NM-II-III.A.3).</li></ul> | <p>1. The student creates an H-R (i.e., Hertzsprung-Russell) diagram showing the relationship between a star's surface temperature and its brightness.</p> <p>OR</p> <p>After watching a video on the universe, the student creates and illustrates an elementary children's book describing the objects in the universe.</p> <p>OR</p> <p>The student designs a board game on the objects in the universe.</p> <ul style="list-style-type: none"><li>✓ creativity</li><li>✓ accuracy</li></ul> <p>2. Using a "universal address" (i.e., street, city, county, state, country, continent, planet, solar system, galaxy, universe), the student defines his/her place in the universe.</p> <ul style="list-style-type: none"><li>✓ expression of ideas</li></ul> <p>3. (first 2 bullets) See Strand II (Content of Science), Content Standard I (Physical Science), Illustration #8.</p> <p>(last bullet) The student assumes the persona of a Chamber of Commerce representative for a particular planet. He/She researches the planet and creates a visual representation (e.g., travel brochure, poster, video, PowerPoint) describing the planet. The description includes length of the day and year, atmosphere, geologic features, gravity, distance from sun, temperature range, size, and any other unique features.</p> <ul style="list-style-type: none"><li>✓ thoroughness</li></ul> |



| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS   |
|------------|---|---|
|            | <p>4. Knows that the regular and predictable motions of the Earth-moon-sun system explain phenomena on Earth including:</p> <ul style="list-style-type: none"> <li>• Earth's motion in relation to a year, a day, the seasons, the phases of the moon, eclipses, tides, and shadows,</li> <li>• moon's orbit around Earth once in 28 days in relation to the phases of the moon (NM-II-III.A.4).</li> </ul> <p><b>Structure of Earth</b></p> <p>5. Knows that Earth is composed of layers that include a crust, mantle, and core (NM-II-III.B.1).</p> <p>6. Knows that Earth's crust is divided into plates that move very slowly in response to movements in the mantle (NM-II-III.B.2).</p> | <ul style="list-style-type: none"> <li>✓ accuracy</li> <li>✓ interesting presentation</li> </ul> <p>4. The student brings in a daily astronomy article from the paper and uses objects or diagrams to model and explain a celestial event that is occurring during the same week.</p> <p style="text-align: center;">OR</p> <p>In a darkened room, using a light source that represents the sun, the student "revolves" around the sun in a counter-clockwise direction, watching shadows as they fall on the equator and specific cities. The student holds a small Styrofoam ball and moves around the light source. The Styrofoam ball can be marked to show the equator and various cities at different latitudes. During the activity, the student discusses his/her observations and then creates a graphic representation of the Earth's position in relation to the sun in each of the four seasons. Finally, the student completes a 3-2-1 evaluation (i.e., 3 things I've learned, 2 questions I still have, 1 thing I enjoyed about the activity).</p> <ul style="list-style-type: none"> <li>✓ accurate observations</li> <li>✓ appropriate depiction of Earth</li> <li>✓ completed evaluation</li> </ul> <p style="text-align: center;">OR</p> <p>The student observes the moon for a month, using a journal to record observations.</p> <p>5. After reading about the layers of the Earth, the student cuts into an apple/peach and describes which part of the fruit corresponds with the crust, mantle, core. He/She then creates an illustration of the observation, labeling accurately.</p> <ul style="list-style-type: none"> <li>✓ accuracy</li> </ul> <p>6. The student draws and labels a map of the Earth, showing the plate boundaries.</p> <p style="text-align: center;">AND</p> |

| GRADE<br>6 | PERFORMANCE STANDARDS  | ILLUSTRATIONS   |
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|            | <p>7. Knows that sedimentary, igneous, and metamorphic rocks contain evidence of the materials, temperatures, and forces that created them (NM-II-III.B.3).</p>  | <p>See Strand II (Content of Science), Content Standard I (Physical Science), Illustration #6.</p> <p>7, 11. (all 3 bullets) Using the information from Illustration #6, the student writes a paragraph on the meaning of the phrase, “The present is key to the past.”</p> <ul style="list-style-type: none"> <li>✓ logical conclusion</li> <li>✓ writing convention</li> </ul> <p style="text-align: center;">OR</p> <p>The student creates a “recipe” containing the materials, temperature, and factors (e.g., weathering) used to create the three types of rocks.</p> <ul style="list-style-type: none"> <li>✓ creativity</li> <li>✓ accuracy</li> <li>✓ thoroughness</li> </ul> <p style="text-align: center;">OR</p> <p>The student demonstrates the process necessary to create the three types of rocks (e.g., sedimentary: sand shaken in water and left to settle; igneous: chocolate melted and allowed to harden; metamorphic: crayon shavings that have been ironed between two pieces of waxed paper).</p> <ul style="list-style-type: none"> <li>✓ accuracy</li> </ul> <p style="text-align: center;">OR</p> <p>The student creates an acrostic poem that describes the material, temperature, and forces necessary for creation for each type of rock.</p> <ul style="list-style-type: none"> <li>✓ proper format</li> <li>✓ writing conventions</li> <li>✓ thoroughness</li> <li>✓ accuracy</li> </ul> |
|            | <p><b>Weather and Climate</b></p> <p>8. Describes the composition (i.e., nitrogen, oxygen, water vapor) and strata of Earth’s atmosphere and differences between the atmosphere of Earth and the atmospheres of other planets (NM-II-III.B.4).</p> | <p>8. The student creates a foldable (see Zike) to scale depicting the different atmospheric layers of the Earth.</p> <ul style="list-style-type: none"> <li>✓ accuracy</li> </ul>  |

| GRADE<br>6 | PERFORMANCE STANDARDS  | ILLUSTRATIONS  |
|------------|--|--|
|            | <p>9. Understands factors that create and influence weather and climate including:</p> <ul style="list-style-type: none"> <li>• heat, air movement, pressure, humidity, oceans</li> <li>• how clouds form by condensation of water vapor</li> <li>• how weather patterns are related to atmospheric pressure</li> <li>• global patterns of atmospheric movement (e.g., El Nino)</li> <li>• factors (e.g., volcanic eruptions, impacts of asteroids, glaciers) that can impact Earth's climate (NM-II-III.B.5).</li> </ul> <p>10. Understands how to use weather maps and data (e.g., barometric pressure, wind speeds, humidity) to predict weather (NM-II-III.B.6).</p> <p><b>Changes to Earth</b></p> <p>11. Knows that landforms are created and change through a combination of constructive and destructive forces including:</p> <ul style="list-style-type: none"> <li>• weathering of rock and soil, transportation and deposition of sediment, tectonic activity,</li> <li>• similarities and differences between current and past processes (e.g., erosion, plate tectonics, changes in atmospheric composition) on Earth's surface,</li> <li>• impact of volcanoes and faults on New Mexico geology (NM-II-III.B.7).</li> </ul> | <p>9, 10. Prior to a visit by a meteorologist, the student creates his/her own KWL (what I KNOW, what I WANT to know, what I've LEARNED) chart on weather, using this chart to prepare relevant questions about factors that create and influence weather. Following the visit, the student revises his/her chart, crossing out any misconceptions he/she had, checking off any topics of interest addressed by the meteorologist, and adding any new information learned either from the meteorologist or from other students' questions. The student then uses weather maps from the newspaper and graphs trends noted in three specific cities. He/She makes predictions for future weather in these cities, citing data that leads to the predictions.</p> <ul style="list-style-type: none"> <li>✓ completion of KWL</li> <li>✓ revised KWL</li> <li>✓ appropriate questions</li> <li>✓ appropriate listening behavior</li> <li>✓ appropriate vocabulary</li> <li>✓ accurate interpretation of maps</li> <li>✓ supporting details for predictions</li> </ul> <p>11. (1<sup>st</sup> bullet) The student demonstrates how water erodes and deposits soil and weathers land using stream tables. (Reference: Bosque Education Guide)</p> <ul style="list-style-type: none"> <li>✓ appropriate examples</li> <li>✓ comprehension</li> </ul> <p>(2<sup>nd</sup> bullet) The student researches catastrophism versus uniformitarianism and then debates both points of view.</p> <ul style="list-style-type: none"> <li>✓ thorough research</li> <li>✓ debate skills</li> <li>✓ support for position</li> </ul> <p>(3<sup>rd</sup> bullet) The student creates three-dimensional clay models of In a large or small group discussion, the student discusses patterns in volcano formation.</p> <p style="text-align: center;">OR</p> <p>The student illustrates/diagrams the Rio Grande Rift. (Bosque Guide)</p> <ul style="list-style-type: none"> <li>✓ creativity</li> <li>✓ reasonably accurate representations</li> </ul> |

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS   |
|------------|---|---|
|            | <p>12. Understands the history of Earth and how information about it comes from layers of sedimentary rock including:</p> <ul style="list-style-type: none"> <li>• sediments and fossils as a record of a very slowly changing world</li> <li>• evidence of asteroid impact, volcanic, and glacial activity (NM-II-III.B.8).</li> </ul> | <ul style="list-style-type: none"> <li>✓ individual participation</li> <li>✓ clear communication</li> </ul> <p>12. See Strand II (Content of Science), Content Standard II (Life Science), Illustrations # 1 – 5.</p> |

**STRAND V: SCIENCE AND SOCIETY****CONTENT STANDARD:** The student understands how scientific discoveries, inventions, and knowledge influence and are influenced by individuals and societies.**BENCHMARK:** The student explains how scientific discoveries and inventions have changed individuals and societies.

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS  |
|------------|---|--|
|            | <ol style="list-style-type: none"><li>Examines the role of scientific knowledge in decisions (e.g., space exploration, what to eat, preventative medicine, and medical treatment) (NM-III.1).</li><li>Describes the technologies (e.g., computers, cellular phones, Internet) responsible for revolutionizing information processing and communications (NM-III.2).</li></ol> | <ol style="list-style-type: none"><li>As part of a small group, the student researches the pros and cons of one form of energy and its impact on society, taking part in a debate between traditional (e.g., fossil fuels) and alternative (e.g., solar, wind, geothermal) energy.<ul style="list-style-type: none"><li>✓ participation</li><li>✓ communication skills</li></ul><p>OR</p><p>Using the following scenario, the student assumes the persona of an energy expert: A new community is being planned. What type of energy should the community use? The student researches one type of energy and generates a persuasive argument to convince the town council to accept his/her proposal. Following presentation of all arguments, a vote is taken to determine which argument was the most persuasive.</p><ul style="list-style-type: none"><li>✓ support for argument</li></ul></li><li>The student creates a flowchart depicting the technologies that have allowed advances in space exploration and/or global communication.<ul style="list-style-type: none"><li>✓ thoroughness</li><li>✓ accuracy</li></ul></li></ol> |

**STRAND VI: LITERACY****CONTENT STANDARD:** The student applies reading, writing, and research skills during the study of science.**BENCHMARK:** The student demonstrates competence in reading, writing, and research skills to comprehend, interpret, and evaluate a wide variety of science-based texts.

| GRADE<br>6 | PERFORMANCE STANDARDS   | ILLUSTRATIONS   |
|------------|---|---|
|            | <ol style="list-style-type: none"><li>1. Uses effective reading strategies (e.g., context clues, rereading, self-correcting, reading with others, predicting, questioning, clarifying, summarizing) to match type of text (APS-LA I.1).</li><li>2. Uses various parts of a text (e.g., title page, index, table of contents, glossary) to clarify confusing part of a text (APS-LA I.2).</li><li>3. Analyzes media as a source of information, entertainment, persuasion, or interpretation of events (APS-LA II.2).</li><li>4. Demonstrates proficiency in using the writing process to create a final product by drafting, revising, editing, and proofreading own written work and that of peers (APS-LA III.1).</li><li>5. Develops proficiency in choosing appropriate technology (e.g., word processor, overhead projector, multimedia) to present information for the intended audience (APS-LA III.3).</li><li>6. Demonstrates proficiency with writing conventions (i.e., grammar, spelling, capitalization, punctuation) (APS-LA III.4).</li><li>7. Demonstrates proficiency in applying appropriate types of writing (e.g., descriptive, narrative, expressive, expository, persuasive, and analytical) for the intended purpose and audience (APS-LA III.5).</li><li>8. Produces informational products and/or presentations that communicate information effectively to a specific audience (APS-LA III.8).</li><li>9. Identifies and uses various elements of texts (e.g., title page, index, table of contents, glossary) to organize and locate specific information (APS-LA VI.2).</li></ol> | <p>1, 2, 9. See Strand II (Content of Science), Content Standard III (Life Science), Illustrations # 1 – 5.</p> <p>3. See Strand II (Content of Science), Content Standard IV (Earth and Space Science), Illustrations #9, 10.</p> <p>4 – 6, 8. See Strand I – Science Fair Projects.<br/>See Strand II (Content of Science), Content Standard IV (Earth and Space Science), Illustration #3, last bullet.</p> <p>7. See Strand V (Science and Society), Illustration #1.</p> |

| <b>GRADE<br/>6</b> | <b>PERFORMANCE STANDARDS</b>   | <b>ILLUSTRATIONS</b>   |
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|                    | <p>10. Uses multiple sources of print and nonprint information (e.g., books, newspapers, Internet, electronic databases, CO-ROMs) to develop informational materials (e.g., brochures, newsletters, advertisements) (APS-LA VI.6).</p> | <p>10. See Strand I – Illustration for performance standards # 1 – 8.<br/>See Strand III (Content of Science – Life Science), Illustration # 1 – 5.<br/>See Strand IV (Content Standard III - Earth and Space Science, 3<sup>rd</sup> Illustration. See Strand V, 1<sup>st</sup> and 2<sup>nd</sup> Illustrations.</p> |